

SHRIRAM CEMENT WORKS: KOTA, RAJASTHAN

UNIT PROFILE

Shriram Cement Works (SCW) is a unit of DCM Shriram Consolidated Limited (DSCL), a company engaged in the manufacture of Urea, PVC, Caustic Soda, Sugar, Cement and Textiles. Besides its own products, it also markets hybrid seeds, POP and DAP. DSCL's annual turnover in 2003-04 was 1476 crores out of which SCW's contribution was 70 crores.

SCW is an **unconventional wet process cement plant** based on waste calcium hydroxide sludge of sister calcium carbide plant, located in the same complex.

SCW was commissioned in 1987 with the technical know-how from M/s. Lafarge Coppee Lavelin, France. Products of the plant are OPC-53 grade and PPC. The **plant is certified for ISO 9001, 14001 and OHSAS 18001** for its effective Quality, Environment, and Occupational Health and Safety Management Systems.

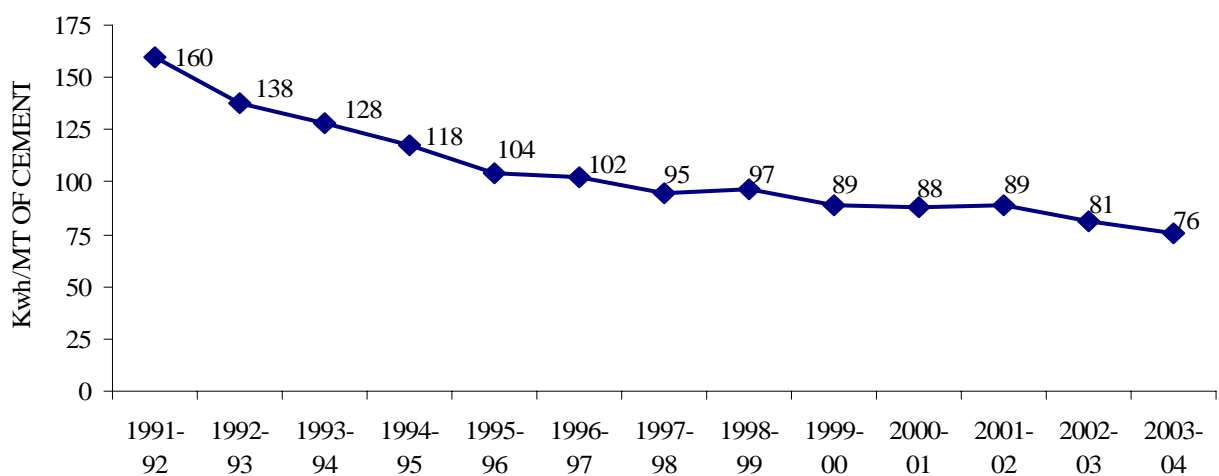
Installed capacity of SCW is 2.0 lakh tons cement per annum. However, its capacity utilisation is consistently above 100% and in 2003-04, it was 147%.

ENERGY CONSUMPTION

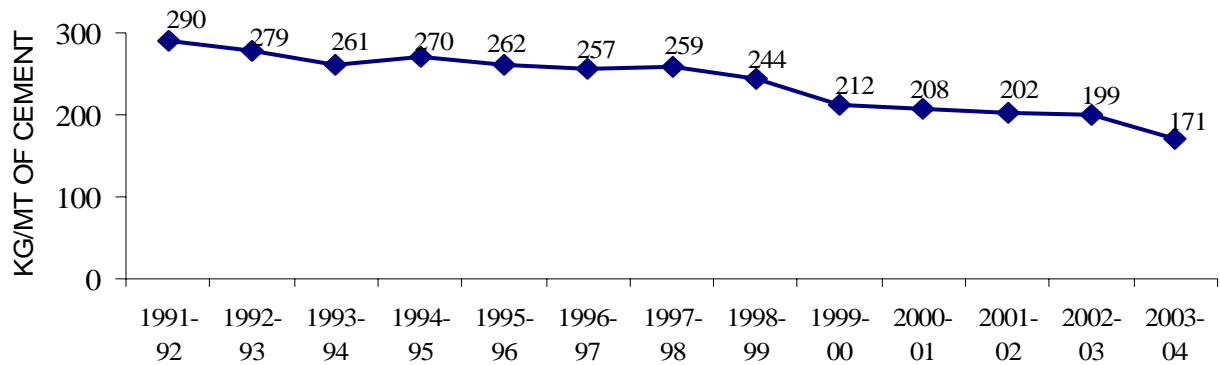
There is steady decline of specific energy consumption due to implementation of various energy conservation measures.

Total electrical energy consumption of the plant in 2003-04 was 225.4 lakh kwh, which is fully met from sister fertiliser plants' captive power plant, located in the same complex. Thermal energy requirements of the plant were met by coal, pet coke and small quantity of furnace oil. In 2003-04, 0.34 lakh tones of coal, 0.16 lakh tons of pet coke and 18 KL of furnace oil were consumed. Specific energy consumption figures for 2003-04 are 76 kwh/t of cement and 1146 Kcal/kg of cement. Cost of the energy is 38% of total Ex-works cost.

Specific Power Consumption Trend



Specific Coal Consumption Trend



ENERGY CONSERVATION COMMITMENT, POLICY AND SET UP

In order to meet company's cost reduction objective and also with an objective to conserve natural resources, special attention is given in reducing energy consumption in various sections of the plant.

To focus the attention on energy conservation, Energy Conservation Cell (EC) was created which is coordinated by energy manager and guided by the top management. It consists of Section-in-charges of production, maintenance and quality.

Energy policy of Shriram Cement Works is enclosed which shows the commitment of top management towards energy conservation.

EC prepares energy performance of the plant on daily and monthly as well as yearly basis. The reports thus prepared are reviewed at different levels of management as given below:

- Daily review in production meeting where weak areas are identified and corrective measures are taken immediately.
- Monthly review by Vice President
- Yearly review for setting up energy targets for next year.

Shriram Cement Works believes in team work and plant optimisation. With the suggestions given by the employees and with modest investments, considerable energy savings were achieved over the years. SCW not only implements latest energy conservation techniques but also sustains it by regular maintenance and by providing adequate training.

ENERGY CONSERVATION ACHIEVEMENTS

During the period 2001-02 to 2003-04, SCW has implemented number of energy conservation measures, which has resulted in **11.3 % saving in sp.elect. energy consumption** and **1.1 % in sp.heat consumption**. A brief description of major projects implemented during the year 2003 -04 is given below.

1. Close Circuiting of Cement Mill

Project Background

Cement mill at Shriram Cement Works was of old technology open circuit 3 chamber ball mill. Open circuit grinding consumes more power, wide particle size distribution and higher fineness is required to maintain desired quality.

Improvements made

- Cement mill was converted to 2 chamber mill and grinding media charge redesigned.
- Mill circuit modified with the introduction of high efficiency separator

View of Close Circuit Cement Mill



Benefits achieved

- Improvement in mill output by 15%.
- Reduction in sp. power consumption by 1 kwh/t
- Improvement in quality of cement allowing higher percentage of pozzolona in PPC
- Increase in quantity of PPC produced

Financial analysis

- Investment	Rs/lac	120
- Energy savings		
- thermal		12.0
- electrical		<u>20.8</u>
	Total :	30.8
- ROI		25.7 *

* In addition, savings also accrued from increase in cement sales volume due to better quality of cement resulting from this modification.

2. Kiln Inlet Enlargement

Background of the project :

Lip plates are provided in the wet kiln inlet to avoid back spillage of slurry. However, lip plate used to increase the kiln dust losses and pressure losses in the ID fan circuit.

Improvements made

Repositioning of feed pipe and redesigning of inlet spirals for better flow of slurry
Lip plate is removed

Technical and Financial analysis

Negligible investment (less than Rs. 20,000/-)

Reduction in dust load:	4% dust losses based on clinker production
Reduction in kiln exit gas volume:	5%
Reduction in pressure at ID fan:	20 mm WG
Savings in thermal energy:	Rs/lacs 8.0
Savings in electrical energy:	Rs/lacs 3.0

Total savings:	Rs/lacs 11.0
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ENERGY CONSERVATION PLANS AND TARGETS

At SCW, several schemes for energy conservation are planned. Major schemes are as follows:

Short Term Measures

Energy Conservation Measures	Year of implementation	Yearly savings			Investment (Rs/Lacs)
		Electrical (Lacs Kwh)	Thermal (Million Kcal)	(Rs/Lacs)	
1. Kiln chain modification	2004	Nil	10.5	47.0	260
2. Increase in production of PPC	2004	4.0	50.0	54.0	Nil
3. Increase in fly ash content of PPC	2004	4.0	90.0	94.6	46
4. Pre-crushing of clinker	2004	4.0	Nil	10.6	100

Long Term Measures

Energy Conservation Measures	Year of implementation	Yearly savings			Investment (Rs/lacs)
		Kwh/t	Kcal/kg	(Rs/Lacs)	
1. Retrofitting of grate cooler	2005	Nil	30	40	100
2. Dry process conversion	2010	10.0	480	750	8000

Our energy conservation targets are to reduce specific power consumption by 10.5% in next 3 years and fuel consumption by 18.8% by implementing latest energy conservation schemes and making higher quantity of PPC and increasing the quantity of fly ash in PPC.

ENVIRONMENT

Besides energy conservation programmes, the plant also gives due attention to environmental improvement. Various dust collecting devices including bag filters, ESP and water spray systems are installed at various locations of the plant. Periodic monitoring of dust emissions are carried out. Reduction in dust emissions helps not only in material and energy conservation but also gives clear environment for safe and healthy working. The plant has accorded special priority towards tree plantation and development of green belt in and around the plant. The **plant is certified for ISO 14001** for its effective environment management system.

SAFETY

Industrial safety is an essential and integral part of energy operation at SCW.

Following are the salient features of safety management:

- Functioning of inter departmental safety committee
- Training imparted to employees on first aid and fire fighting
- Work permit system for all types of maintenance jobs
- On-site and off-site emergency plans
- Safety audit by internal as well as external auditors

In addition, safety day is celebrated every year on 4th March, where Executive Director of the company distributes prizes for fire fighting and persons who have won prizes on safety slogans/sketches/poem competitions.

The **plant is certified with OHSAS 18001** for its effective safety and occupational health management system. The plant has achieved **Zero accident since May 2001** and was recently awarded **Silver prize by "Green Tech foundation, New Delhi"** for overall safety performance for the year 2003.